

Table 4. Sepsis risk analysis in relation to attributes.

ATTRIBUTES	TOTAL OF RECORDS	QUANTIFY OF CASES SEPSIS	QUANTIFY OF WITHOUT SEPSIS	MEAN	SD	RP	RR	OR	IC OR	CHI-SQUARE	P-VALUE	% SEPSIS IN THE CATEGORICAL	% SEPSIS IN THE TOTAL
<b>DELIVERY_TYPE</b>													
cesarean	894	129	765	0.144	0.352	0.597	0.597	0.529	0.411 – 0.680	24.413	0	14.4295	42.1569
vaginal	714	173	541	0.242	0.429	1.661	1.661	1.873	1.457 – 2.408	23.765	0	24.2297	56.5359
forceps	6	2	4	0.333	0.516	1.776	1.776	2.164	0.395 – 11.871	0.151	0.698	33.3333	0.6536
S.I.	12	2	10	0.167	0.389	0.885	0.885	0.862	0.188 – 3.954	0.000	1	16.6667	0.6536
<b>APGAR_1MIN</b>													
0	6	4	2	0.667	0.516	3.576	3.576	8.728	1.591 – 47.874	6.155	0.0131	66.6667	1.3072
1	13	5	8	0.385	0.506	2.061	2.061	2.724	0.885 – 8.386	2.140	0.1435	38.4615	1.634
2	29	16	13	0.552	0.506	3.038	3.038	5.547	2.639 – 11.659	23.176	0	55.1724	5.2288
3	53	17	36	0.321	0.471	1.746	1.746	2.098	1.162 – 3.788	5.437	0.0197	32.0755	5.5556
4	57	16	41	0.281	0.453	1.519	1.519	1.721	0.952 – 3.110	2.711	0.0996	28.0702	5.2288
5	72	17	55	0.236	0.428	1.270	1.270	1.353	0.774 – 2.365	0.828	0.3629	23.6111	5.5556
6	101	31	70	0.307	0.464	1.702	1.702	2.013	1.293 – 3.134	9.127	0.0025	30.6931	10.1307
7	192	42	150	0.219	0.415	1.188	1.188	1.241	0.859 – 1.792	1.114	0.2913	21.875	13.7255
8	598	98	500	0.164	0.371	0.810	0.810	0.773	0.593 – 1.007	3.412	0.0647	16.388	32.0261
9	470	52	418	0.111	0.314	0.504	0.504	0.442	0.321 – 0.608	25.317	0	11.0638	16.9935
10	2	0	2	0.000	0.000	0.000	0.000	indefinite	indefinite	0.000	1	0	0
S.I.	33	8	25	0.242	0.435	1.296	1.296	1.391	0.621 – 3.114	0.337	0.5617	24.2424	2.6144
<b>APGAR_5MIN</b>													
1	3	3	0	1.000	0.000	5.356	5.356	indefinite	indefinite	8.188	0.0042	100	0.9804
2	4	3	1	0.750	0.500	4.015	4.015	13.059	1.354 – 125.980	5.008	0.0252	75	0.9804
3	3	2	1	0.667	0.577	3.559	3.559	8.678	0.784 – 96.009	1.913	0.1667	66.6667	0.6536
4	11	5	6	0.455	0.522	2.439	2.439	3.638	1.103 – 11.999	3.537	0.06	45.4545	1.634
5	19	11	8	0.579	0.507	3.154	3.154	6.115	2.438 – 15.336	16.713	0	57.8947	3.5948
6	21	10	11	0.476	0.512	2.582	2.582	4.020	1.692 – 9.554	9.719	0.0018	47.619	3.268
7	66	24	42	0.364	0.485	2.012	2.012	2.590	1.543 – 4.346	12.689	0.0004	36.3636	7.8431
8	295	70	225	0.237	0.426	1.338	1.338	1.444	1.066 – 1.954	5.300	0.0213	23.7288	22.8758
9	975	148	827	0.152	0.359	0.625	0.625	0.558	0.435 – 0.717	20.526	0	15.1795	48.366
10	201	24	177	0.119	0.325	0.603	0.603	0.550	0.352 – 0.858	6.599	0.0102	11.9403	7.8431
S.I.	28	6	22	0.214	0.418	1.141	1.141	1.180	0.474 – 2.936	0.013	0.9104	21.4286	1.9608
<b>BAG_MASK_VENTILATION_RESUSCITATION</b>													
yes	439	143	296	0.326	0.469	2.372	2.372	3.035	2.342 – 3.933	73.244	0	32.574	46.732
no	15	6	9	0.400	0.507	2.148	2.148	2.913	1.029 – 8.247	3.157	0.0756	40	1.9608
S.I.	1172	157	1015	0.134	0.341	0.408	0.408	0.317	0.245 – 0.410	79.543	0	13.3959	51.3072
<b>CARDIAC_MASSAGE_RESUSCITATION</b>													
yes	11	8	3	0.727	0.467	3.941	3.941	11.785	3.108 – 44.687	17.664	0	72.7273	2.6144
no	441	141	300	0.320	0.467	2.296	2.296	2.905	2.242 – 3.765	67.353	0	31.9728	46.0784
S.I.	1174	157	1017	0.134	0.341	0.406	0.406	0.314	0.242 – 0.406	80.714	0	13.3731	51.3072
<b>RESUSCITATION_DRUG</b>													
yes	587	178	409	0.303	0.460	2.461	2.461	3.097	2.399 – 3.999	78.410	0	30.3237	58.1699
no	1019	125	894	0.123	0.328	0.411	0.411	0.329	0.255 – 0.425	75.562	0	12.2669	40.8497
S.I.	20	3	17	0.150	0.366	0.795	0.795	0.759	0.221 – 2.606	0.023	0.8793	15	0.9804
<b>TRACHEAL_CANNULA_VENTILATION_RESUSCITATION</b>													
yes	13	9	4	0.692	0.480	3.760	3.760	9.970	3.050 – 32.592	18.600	0	69.2308	2.9412
no	440	140	300	0.318	0.466	2.273	2.273	2.867	2.213 – 3.716	65.558	0	31.8182	45.7516
S.I.	1173	157	1016	0.134	0.341	0.407	0.407	0.315	0.244 – 0.408	80.127	0	13.3845	51.3072
<b>OXYGEN_RESUSCITATION</b>													
yes	403	143	260	0.355	0.479	2.662	2.662	3.577	2.751 – 4.650	95.951	0	35.4839	46.732

	no	50	7	43	0.140	0.351	0.738	0.738	0.695	0.310 – 1.561	0.493	0.4828	14	2.2876
	S.I.	1173	156	1017	0.133	0.340	0.402	0.402	0.310	0.239 – 0.401	82.681	0	13.2992	50.9804
<b>GESTATIONAL_DRUGS</b>														
	yes	94	24	70	0.255	0.438	1.387	1.387	1.520	0.939 – 2.459	2.495	0.1142	25.5319	7.8431
	no	1498	277	1221	0.185	0.388	0.816	0.816	0.774	0.502 – 1.195	1.080	0.2987	18.4913	90.5229
	S.I.	34	5	29	0.147	0.360	0.778	0.778	0.739	0.284 – 1.926	0.159	0.6903	14.7059	1.634
<b>GESTATIONAL_AGE_WEEKS</b>														
	23	7	6	1	0.857	0.378	4.626	4.626	26.380	3.164 – 219.932	16.430	0.0001	85.7143	1.9608
	24	7	5	2	0.714	0.488	3.842	3.842	10.947	2.114 – 56.693	9.513	0.002	71.4286	1.634
	25	14	10	4	0.714	0.469	3.890	3.890	11.115	3.462 – 35.682	22.228	0	71.4286	3.268
	26	14	7	7	0.500	0.519	2.696	2.696	4.391	1.529 – 12.614	7.046	0.0079	50	2.2876
	27	27	17	10	0.630	0.492	3.484	3.484	7.706	3.492 – 17.003	32.144	0	62.963	5.5556
	28	30	20	10	0.667	0.480	3.720	3.720	9.161	4.242 – 19.781	42.666	0	66.6667	6.5359
	29	36	24	12	0.667	0.478	3.759	3.759	9.277	4.585 – 18.771	52.012	0	66.6667	7.8431
	30	52	33	19	0.635	0.486	3.659	3.659	8.277	4.637 – 14.773	67.088	0	63.4615	10.7843
	31	64	33	31	0.516	0.504	2.950	2.950	5.026	3.026 – 8.348	44.549	0	51.5625	10.7843
	32	73	26	47	0.356	0.482	1.975	1.975	2.515	1.531 – 4.131	12.988	0.0003	35.6164	8.4967
	33	125	27	98	0.216	0.413	1.162	1.162	1.207	0.773 – 1.884	0.502	0.4784	21.6	8.8235
	34	154	18	136	0.117	0.322	0.597	0.597	0.544	0.327 – 0.904	5.158	0.0231	11.6883	5.8824
	35	166	22	144	0.133	0.340	0.681	0.681	0.633	0.397 – 1.009	3.354	0.067	13.253	7.1895
	36	176	9	167	0.051	0.221	0.250	0.250	0.209	0.106 – 0.414	23.271	0	5.1136	2.9412
	37	210	13	197	0.062	0.242	0.299	0.299	0.253	0.142 – 0.450	24.233	0	6.1905	4.2484
	38	181	8	173	0.044	0.206	0.214	0.214	0.178	0.087 – 0.366	26.591	0	4.4199	2.6144
	39	145	16	129	0.110	0.314	0.564	0.564	0.509	0.298 – 0.870	5.768	0.0163	11.0345	5.2288
	40	106	6	100	0.057	0.232	0.287	0.287	0.244	0.106 – 0.561	11.947	0.0005	5.6604	1.9608
	41	29	4	25	0.138	0.351	0.729	0.729	0.686	0.237 – 1.986	0.211	0.6462	13.7931	1.3072
	42	2	0	2	0.000	0.000	0.000	0.000	indefinite	indefinite	0.000	1	0	0
	47	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
	48	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
	S.I.	6	2	4	0.333	0.516	1.776	1.776	2.164	0.395 – 11.871	0.151	0.698	33.3333	0.6536
<b>MATERNAL_RACE_COLOR</b>														
	black	229	34	195	0.149	0.356	0.763	0.763	0.721	0.489 – 1.063	2.458	0.1169	14.8472	11.1111
	blown	1147	221	926	0.193	0.395	1.086	1.086	1.106	0.839 – 1.459	0.418	0.5181	19.2677	72.2222
	white	183	38	145	0.208	0.407	1.118	1.118	1.149	0.785 – 1.682	0.378	0.5389	20.765	12.4183
	yellow	3	1	2	0.333	0.577	1.774	1.774	2.161	0.195 – 23.905	0.000	1	33.3333	0.3268
	indigenous	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
	S.I.	63	12	51	0.191	0.396	1.013	1.013	1.016	0.535 – 1.929	0.000	1	19.0476	3.9216
<b>MATERNAL_AGE</b>														
	13	5	2	3	0.400	0.548	2.133	2.133	2.888	0.481 – 17.360	0.410	0.5218	40	0.6536
	14	16	5	11	0.313	0.479	1.672	1.672	1.977	0.682 – 5.731	0.916	0.3385	31.25	1.634
	15	32	9	23	0.281	0.457	1.509	1.509	1.709	0.783 – 3.731	1.281	0.2577	28.125	2.9412
	16	46	13	33	0.283	0.455	1.524	1.524	1.730	0.900 – 3.329	2.163	0.1414	28.2609	4.2484
	17	35	7	28	0.200	0.406	1.064	1.064	1.080	0.467 – 2.497	0.000	1	20	2.2876
	18	47	10	37	0.213	0.414	1.135	1.135	1.171	0.576 – 2.383	0.062	0.8041	21.2766	3.268
	19	58	9	49	0.155	0.365	0.819	0.819	0.786	0.382 – 1.618	0.234	0.6283	15.5172	2.9412
	20	66	11	55	0.167	0.376	0.881	0.881	0.858	0.443 – 1.659	0.088	0.7672	16.6667	3.5948
	21	69	10	59	0.145	0.355	0.762	0.762	0.722	0.365 – 1.428	0.612	0.4341	14.4928	3.268
	22	83	15	68	0.181	0.387	0.958	0.958	0.949	0.535 – 1.684	0.001	0.9724	18.0723	4.902
	23	83	13	70	0.157	0.366	0.825	0.825	0.792	0.432 – 1.452	0.374	0.5411	15.6627	4.2484
	24	79	16	63	0.203	0.405	1.080	1.080	1.101	0.627 – 1.934	0.035	0.8519	20.2532	5.2288
	25	67	19	48	0.284	0.454	1.540	1.540	1.754	1.016 – 3.030	3.536	0.06	28.3582	6.2092

26	62	7	55	0.113	0.319	0.591	0.591	0.538	0.243 – 1.194	1.907	0.1673	11.2903	2.2876
27	78	18	60	0.231	0.424	1.240	1.240	1.313	0.763 – 2.257	0.702	0.4023	23.0769	5.8824
28	68	9	59	0.132	0.341	0.694	0.694	0.648	0.318 – 1.321	1.092	0.296	13.2353	2.9412
29	74	8	66	0.108	0.313	0.563	0.563	0.510	0.242 – 1.074	2.729	0.0986	10.8108	2.6144
30	67	15	52	0.224	0.420	1.199	1.199	1.257	0.698 – 2.264	0.364	0.5461	22.3881	4.902
31	59	9	50	0.153	0.363	0.805	0.805	0.770	0.374 – 1.583	0.296	0.5864	15.2542	2.9412
32	49	5	44	0.102	0.306	0.535	0.535	0.482	0.189 – 1.225	1.907	0.1672	10.2041	1.634
33	71	13	58	0.183	0.390	0.972	0.972	0.965	0.522 – 1.785	0.000	1	18.3099	4.2484
34	54	12	42	0.222	0.420	1.188	1.188	1.242	0.646 – 2.388	0.224	0.6358	22.2222	3.9216
35	57	11	46	0.193	0.398	1.026	1.026	1.033	0.529 – 2.018	0.000	1	19.2982	3.5948
36	52	14	38	0.269	0.448	1.451	1.451	1.618	0.865 – 3.024	1.794	0.1805	26.9231	4.5752
37	52	12	40	0.231	0.425	1.235	1.235	1.306	0.677 – 2.521	0.382	0.5365	23.0769	3.9216
38	25	4	21	0.160	0.374	0.848	0.848	0.819	0.279 – 2.404	0.011	0.9159	16	1.3072
39	40	4	36	0.100	0.304	0.525	0.525	0.472	0.167 – 1.337	1.538	0.2149	10	1.3072
40	27	7	20	0.259	0.447	1.386	1.386	1.522	0.638 – 3.632	0.496	0.4811	25.9259	2.2876
41	17	6	11	0.353	0.493	1.893	1.893	2.380	0.873 – 6.486	2.060	0.1512	35.2941	1.9608
42	10	1	9	0.100	0.316	0.530	0.530	0.478	0.060 – 3.784	0.096	0.7566	10	0.3268
43	12	2	10	0.167	0.389	0.885	0.885	0.862	0.188 – 3.954	0.000	1	16.6667	0.6536
44	6	0	6	0.000	0.000	0.000	0.000	indefinite	indefinite	0.433	0.5103	0	0
45	4	0	4	0.000	0.000	0.000	0.000	indefinite	indefinite	0.105	0.7461	0	0
46	2	2	0	1.000	0.000	5.342	5.342	indefinite	indefinite	4.137	0.042	100	0.6536
47	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
49	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
S.I.	52	8	44	0.154	0.364	0.813	0.813	0.779	0.363 – 1.671	0.215	0.6428	15.3846	2.6144
<b>MULTIPLE_GESTATION</b>													
yes	112	35	77	0.313	0.466	1.746	1.746	2.085	1.369 – 3.175	11.308	0.0008	31.25	11.4379
no	1502	268	1234	0.178	0.383	0.582	0.582	0.492	0.328 – 0.736	11.465	0.0007	17.8429	87.5817
S.I.	12	3	9	0.250	0.452	1.332	1.332	1.442	0.388 – 5.359	0.032	0.8578	25	0.9804
<b>SEX</b>													
male	892	171	721	0.192	0.394	1.042	1.042	1.052	0.819 – 1.352	0.113	0.7371	19.1704	55.8824
female	732	134	598	0.183	0.387	0.951	0.951	0.941	0.732 – 1.208	0.173	0.6779	18.306	43.7908
S.I.	2	1	1	0.500	0.707	2.662	2.662	4.325	0.270 – 69.333	0.050	0.8229	50	0.3268
<b>MECHANICAL_VENTILATION</b>													
yes	204	142	62	0.696	0.461	6.036	6.036	17.568	12.507 – 24.679	390.057	0	69.6078	46.4052
no	1415	164	1251	0.116	0.320	0.172	0.172	0.064	0.046 – 0.089	369.361	0	11.5901	53.5948
S.I.	7	0	7	0.000	0.000	0.000	0.000	indefinite	indefinite	0.627	0.4283	0	0
<b>SURFACTANT</b>													
yes	203	131	72	0.645	0.480	5.247	5.247	12.975	9.345 – 18.015	313.864	0	64.532	42.8105
no	1412	174	1238	0.123	0.329	0.200	0.200	0.087	0.064 – 0.120	293.133	0	12.3229	56.8627
S.I.	11	1	10	0.091	0.302	0.481	0.481	0.430	0.055 – 3.368	0.195	0.659	9.0909	0.3268
<b>UMBILICAL_ARTERIAL_CATHETER</b>													
yes	3	3	0	1.000	0.000	5.356	5.356	indefinite	indefinite	8.188	0.0042	100	0.9804
no	1619	302	1317	0.187	0.390	0.326	0.326	0.172	0.038 – 0.772	4.474	0.0344	18.6535	98.6928
S.I.	4	1	3	0.250	0.500	1.330	1.330	1.439	0.149 – 13.885	0.000	1	25	0.3268
<b>CARDIAC_ANOMALIES</b>													
yes	50	31	19	0.620	0.490	3.553	3.553	7.719	4.297 – 13.865	60.077	0	62	10.1307
no	1576	275	1301	0.175	0.380	0.281	0.281	0.130	0.072 – 0.233	60.077	0	17.4492	89.8693
<b>INTRACRANIAL_HEMORRHAGE</b>													
grade 0	352	109	243	0.310	0.463	2.003	2.003	2.452	1.868 – 3.220	42.378	0	30.9659	35.6209
grade I	154	89	65	0.578	0.496	3.920	3.920	7.919	5.576 – 11.246	166.319	0	57.7922	29.085
grade II	21	19	2	0.905	0.301	5.060	5.060	43.627	10.105 – 188.347	66.831	0	90.4762	6.2092

grade III	2	2	0	1.000	0.000	5.342	5.342	indefinite	indefinite	4.137	0.042	100	0.6536
grade IV	3	1	2	0.333	0.577	1.774	1.774	2.161	0.195 – 23.905	0.000	1	33.3333	0.3268
no Exam performed	1088	85	1003	0.078	0.269	0.190	0.190	0.122	0.092 – 0.161	258.578	0	7.8125	27.7778
S.I.	6	1	5	0.167	0.408	0.885	0.885	0.862	0.100 – 7.407	0.000	1	16.6667	0.3268
<b>NEC</b>													
yes	14	12	2	0.857	0.363	4.700	4.700	26.898	5.988 – 120.823	37.065	0	85.7143	3.9216
no	1587	288	1299	0.182	0.386	0.393	0.393	0.259	0.136 – 0.492	17.752	0	18.1474	94.1176
S.I.	25	6	19	0.240	0.436	1.281	1.281	1.369	0.542 – 3.458	0.168	0.6818	24	1.9608
<b>EPICUTANEOUS_ACCESS</b>													
yes	169	128	41	0.757	0.430	6.200	6.200	22.432	15.263 – 32.970	395.825	0	75.7396	41.8301
no	1456	178	1278	0.122	0.328	0.162	0.162	0.046	0.031 – 0.067	392.220	0	12.2253	58.1699
S.I.	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
<b>PULMONARY_ANOMALIES</b>													
yes	1	1	0	1.000	NaN	5.328	5.328	indefinite	indefinite	0.637	0.4249	100	0.3268
no	1625	305	1320	0.188	0.391	0.188	0.188	indefinite	indefinite	0.637	0.4249	18.7692	99.6732
<b>SURGERY_CONGENITAL_ANOMALY</b>													
yes	11	5	6	0.455	0.522	2.439	2.439	3.638	1.103 – 11.999	3.537	0.06	45.4545	1.634
no	1518	281	1237	0.185	0.389	0.800	0.800	0.754	0.473 – 1.201	1.132	0.2874	18.5112	91.8301
S.I.	97	20	77	0.206	0.407	1.102	1.102	1.129	0.679 – 1.877	0.111	0.7387	20.6186	6.5359
<b>NASAL_CPAP_DELIVERY_ROOM</b>													
yes	294	122	172	0.415	0.494	3.004	3.004	4.425	3.347 – 5.852	119.003	0	41.4966	39.8693
no	159	27	132	0.170	0.377	0.893	0.893	0.871	0.564 – 1.344	0.268	0.6048	16.9811	8.8235
S.I.	1173	157	1016	0.134	0.341	0.407	0.407	0.315	0.244 – 0.408	80.127	0	13.3845	51.3072
<b>CPAP_NASAL</b>													
yes	865	248	617	0.287	0.453	3.762	3.762	4.872	3.589 – 6.613	116.032	0	28.6705	81.0458
no	752	57	695	0.076	0.265	0.266	0.266	0.206	0.151 – 0.280	114.316	0	7.5798	18.6275
S.I.	9	1	8	0.111	0.333	0.589	0.589	0.538	0.067 – 4.315	0.027	0.8684	11.1111	0.3268
<b>NASAL_CPAP_WITHOUT_MECHANICAL_VENTILATION</b>													
yes	771	206	565	0.267	0.443	2.284	2.284	2.753	2.117 – 3.579	58.909	0	26.7185	67.3203
no	838	97	741	0.116	0.320	0.436	0.436	0.363	0.278 – 0.472	58.420	0	11.5752	31.6993
S.I.	17	3	14	0.177	0.393	0.937	0.937	0.924	0.264 – 3.234	0.000	1	17.6471	0.9804
<b>ANTENATAL_STEROID</b>													
yes	589	196	393	0.333	0.472	3.137	3.137	4.203	3.235 – 5.460	124.876	0	33.2767	64.0523
no	1022	105	917	0.103	0.304	0.309	0.309	0.230	0.176 – 0.299	129.999	0	10.274	34.3137
S.I.	15	5	10	0.333	0.488	1.784	1.784	2.176	0.738 – 6.413	1.239	0.2657	33.3333	1.634
<b>PRENATAL_VISITS</b>													
1	40	19	21	0.475	0.506	2.625	2.625	4.095	2.173 – 7.717	20.198	0	47.5	6.2092
2	60	17	43	0.283	0.454	1.535	1.535	1.747	0.982 – 3.107	3.073	0.0796	28.3333	5.5556
3	96	31	65	0.323	0.470	1.797	1.797	2.177	1.392 – 3.404	11.202	0.0008	32.2917	10.1307
4	142	44	98	0.310	0.464	1.755	1.755	2.094	1.432 – 3.062	14.215	0.0002	30.9859	14.3791
5	154	43	111	0.279	0.450	1.563	1.563	1.781	1.222 – 2.595	8.580	0.0034	27.9221	14.0523
6	179	32	147	0.179	0.384	0.944	0.944	0.932	0.622 – 1.396	0.058	0.81	17.8771	10.4575
7	186	20	166	0.108	0.311	0.541	0.541	0.486	0.300 – 0.787	8.359	0.0038	10.7527	6.5359
8	153	20	133	0.131	0.338	0.673	0.673	0.624	0.383 – 1.016	3.248	0.0715	13.0719	6.5359
9	119	13	106	0.109	0.313	0.562	0.562	0.508	0.282 – 0.917	4.696	0.0302	10.9244	4.2484
10	139	20	119	0.144	0.352	0.748	0.748	0.706	0.432 – 1.153	1.649	0.1991	14.3885	6.5359
more than 10	233	19	214	0.082	0.274	0.396	0.396	0.342	0.210 – 0.557	19.441	0	8.1545	6.2092
did not perform consultations	97	22	75	0.227	0.421	1.221	1.221	1.286	0.786 – 2.104	0.756	0.3846	22.6804	7.1895
S.I.	28	6	22	0.214	0.418	1.141	1.141	1.180	0.474 – 2.936	0.013	0.9104	21.4286	1.9608
<b>RUPTURED_MEMBRANE</b>													
>= 18h at 24h	63	18	45	0.286	0.455	1.551	1.551	1.771	1.010 – 3.104	3.443	0.0635	28.5714	5.8824

	< 18h	418	71	347	0.170	0.376	0.873	0.873	0.847	0.632 – 1.135	1.082	0.2983	16.9856	23.2026
	> 24h	224	69	155	0.308	0.463	1.822	1.822	2.188	1.595 – 3.002	23.522	0	30.8036	22.549
	no	912	147	765	0.161	0.368	0.724	0.724	0.671	0.523 – 0.861	9.518	0.002	16.1184	48.0392
	S.I.	9	1	8	0.111	0.333	0.589	0.589	0.538	0.067 – 4.315	0.027	0.8684	11.1111	0.3268
<b>RDS</b>														
	yes	17	11	6	0.647	0.493	3.529	3.529	8.166	2.996 – 22.258	20.739	0	64.7059	3.5948
	no	1596	294	1302	0.184	0.388	0.461	0.461	0.339	0.161 – 0.711	7.618	0.0058	18.4211	96.0784
	S.I.	13	1	12	0.077	0.277	0.407	0.407	0.357	0.046 – 2.759	0.455	0.5001	7.6923	0.3268
<b>TTN</b>														
	yes	503	225	278	0.447	0.498	6.202	6.202	10.412	7.819 – 13.864	317.638	0	44.7316	73.5294
	no	1118	80	1038	0.072	0.258	0.161	0.161	0.096	0.072 – 0.128	316.205	0	7.1556	26.1438
	S.I.	5	1	4	0.200	0.447	1.063	1.063	1.079	0.120 – 9.685	0.000	1	20	0.3268
<b>SYPHILIS_TREATMENT_CONGENITAL</b>														
	yes	10	1	9	0.100	0.316	0.530	0.530	0.478	0.060 – 3.784	0.096	0.7566	10	0.3268
	no	1612	305	1307	0.189	0.392	2.649	2.649	3.034	0.395 – 23.279	0.607	0.4358	18.9206	99.6732
	S.I.	4	0	4	0.000	0.000	0.000	0.000	indefinite	indefinite	0.105	0.7461	0	0
<b>PULMONARY_HYPERTENSION</b>														
	yes	835	84	751	0.101	0.301	0.358	0.358	0.287	0.218 – 0.377	85.027	0	10.0599	27.451
	no	781	220	561	0.282	0.450	2.768	2.768	3.461	2.637 – 4.543	84.820	0	28.169	71.8954
	S.I.	10	2	8	0.200	0.422	1.063	1.063	1.079	0.228 – 5.106	0.000	1	20	0.6536
<b>PULMONARY_HEMORRHAGE</b>														
	yes	37	19	18	0.514	0.507	2.843	2.843	4.789	2.482 – 9.239	24.095	0	51.3514	6.2092
	no	1575	285	1290	0.181	0.385	0.439	0.439	0.316	0.178 – 0.559	15.749	0.0001	18.0952	93.1373
	S.I.	14	2	12	0.143	0.363	0.758	0.758	0.717	0.160 – 3.221	0.009	0.9263	14.2857	0.6536
<b>CONGENITAL_PNEUMONIA</b>														
	yes	22	14	8	0.636	0.492	3.496	3.496	7.863	3.268 – 18.917	26.422	0	63.6364	4.5752
	no	1594	292	1302	0.183	0.387	0.419	0.419	0.288	0.142 – 0.586	11.668	0.0006	18.3187	95.4248
	S.I.	10	0	10	0.000	0.000	0.000	0.000	indefinite	indefinite	1.258	0.2621	0	0
<b>ACQUIRED_PNEUMONIA</b>														
	yes	7	5	2	0.714	0.488	3.842	3.842	10.947	2.114 – 56.693	9.513	0.002	71.4286	1.634
	no	1610	300	1310	0.186	0.390	0.497	0.497	0.382	0.138 – 1.058	2.559	0.1096	18.6335	98.0392
	S.I.	9	1	8	0.111	0.333	0.589	0.589	0.538	0.067 – 4.315	0.027	0.8684	11.1111	0.3268
<b>PNEUMOTHORAX_MECHANICAL_VENTILATION</b>														
	no	1594	290	1304	0.182	0.386	0.364	0.364	0.222	0.110 – 0.450	18.743	0	18.1932	94.7712
	S.I.	14	2	12	0.143	0.363	0.758	0.758	0.717	0.160 – 3.221	0.009	0.9263	14.2857	0.6536
	yes	18	14	4	0.778	0.428	4.283	4.283	15.774	5.155 – 48.268	37.604	0	77.7778	4.5752
<b>EDUCATION_YEARS</b>														
	< 8 years	493	112	381	0.227	0.419	1.327	1.327	1.423	1.096 – 1.848	6.678	0.0098	22.7181	36.6013
	8 years	91	18	73	0.198	0.401	1.054	1.054	1.068	0.627 – 1.817	0.011	0.9177	19.7802	5.8824
	9 to 11 years	885	148	737	0.167	0.373	0.784	0.784	0.741	0.578 – 0.951	5.288	0.0215	16.7232	48.366
	12 years or more	101	19	82	0.188	0.393	1.000	1.000	0.999	0.597 – 1.673	0.000	1	18.8119	6.2092
	S.I.	56	9	47	0.161	0.371	0.850	0.850	0.821	0.398 – 1.693	0.131	0.7178	16.0714	2.9412
<b>UMBILICAL_VENOUS_CATHETER</b>														
	yes	254	168	86	0.661	0.474	6.576	6.576	17.468	12.763 – 23.908	437.584	0	66.1417	54.902
	no	1371	138	1233	0.101	0.301	0.153	0.153	0.058	0.042 – 0.079	434.815	0	10.0656	45.098
	S.I.	1	0	1	0.000	NaN	0.000	0.000	indefinite	indefinite	0.000	1	0	0
<b>VENTILATOR_ASSOCIATED_PNEUMONIA</b>														
	no	1611	297	1314	0.184	0.388	0.307	0.307	0.151	0.053 – 0.427	14.195	0.0002	18.4358	97.0588
	yes	9	7	2	0.778	0.441	4.206	4.206	15.428	3.189 – 74.639	16.894	0	77.7778	2.2876
	S.I.	6	2	4	0.333	0.516	1.776	1.776	2.164	0.395 – 11.871	0.151	0.698	33.3333	0.6536
<b>BIRTH_WEIGHT</b>														

Very low + extreme low weight	130	103	0.558	0.498	4.416	4.416	8.727146 – 11.817	240.562	0	55.794	42.4837
Low weight	112	472	0.192	0.394	1.030	1.030	1.037,801 – 1.343	0.045	0.8328	19.1781	36.6013
Normal weight	58	655	0.081	0.274	0.299	0.299	0.237,175 – 0.322	93.644	0	8.1346	18.9542
Macrosomia	6	90	0.063	0.243	0.319	0.319	0.273,118 – 0.631	9.694	0.0018	6.25	1.9608

**Table 5. Statistical analysis of the models based on the f1-score metric.**

Experiment	Model	Compared Experiment	Compared Model	p-value (f1-score)
Literature-based attributes	Adaboost	Statistical-based attributes	Adaboost	1.69e-14
Literature-based attributes	Adaboost	Statistical-based attributes	Catboost	5.57e-13
Literature-based attributes	Adaboost	Statistical-based attributes	GradientBoosting	1.69e-14
Literature-based attributes	Adaboost	Statistical-based attributes	LightGBM	1.69e-14
Literature-based attributes	Adaboost	Statistical-based attributes	RandomForest	7.03e-10
Literature-based attributes	Adaboost	Statistical-based attributes	XGBoost	1.69e-14
Literature-based attributes	Adaboost	SHAP-based attributes	Adaboost	1.69e-14
Literature-based attributes	Adaboost	SHAP-based attributes	Catboost	7.18e-13
Literature-based attributes	Adaboost	SHAP-based attributes	GradientBoosting	4.17e-13
<b>Literature-based attributes</b>	<b>Adaboost</b>	<b>SHAP-based attributes</b>	<b>LightGBM</b>	<b>1.00e+00</b>
Literature-based attributes	Adaboost	SHAP-based attributes	RandomForest	5.65e-13
Literature-based attributes	Adaboost	SHAP-based attributes	XGBoost	1.69e-14
Literature-based attributes	Catboost	Statistical-based attributes	Adaboost	7.46e-13
Literature-based attributes	Catboost	Statistical-based attributes	Catboost	6.84e-04
Literature-based attributes	Catboost	Statistical-based attributes	GradientBoosting	3.75e-11
Literature-based attributes	Catboost	Statistical-based attributes	LightGBM	9.75e-09
<b>Literature-based attributes</b>	<b>Catboost</b>	<b>Statistical-based attributes</b>	<b>RandomForest</b>	<b>4.82e-01</b>
Literature-based attributes	Catboost	Statistical-based attributes	XGBoost	9.75e-09
Literature-based attributes	Catboost	SHAP-based attributes	Adaboost	7.46e-13
Literature-based attributes	Catboost	SHAP-based attributes	Catboost	1.23e-06
Literature-based attributes	Catboost	SHAP-based attributes	GradientBoosting	8.97e-12
Literature-based attributes	Catboost	SHAP-based attributes	LightGBM	7.46e-13
Literature-based attributes	Catboost	SHAP-based attributes	RandomForest	7.03e-07
Literature-based attributes	Catboost	SHAP-based attributes	XGBoost	9.75e-09
Literature-based attributes	GradientBo	Statistical-based attributes	Adaboost	1.69e-14
Literature-based attributes	GradientBo	Statistical-based attributes	Catboost	2.36e-05
Literature-based attributes	GradientBo	Statistical-based attributes	GradientBoosting	1.69e-14
Literature-based attributes	GradientBo	Statistical-based attributes	LightGBM	1.69e-14
<b>Literature-based attributes</b>	<b>GradientBo</b>	<b>Statistical-based attributes</b>	<b>RandomForest</b>	<b>1.57e-01</b>
Literature-based attributes	GradientBo	Statistical-based attributes	XGBoost	1.69e-14
Literature-based attributes	GradientBo	SHAP-based attributes	Adaboost	1.69e-14
Literature-based attributes	GradientBo	SHAP-based attributes	Catboost	7.18e-13
Literature-based attributes	GradientBo	SHAP-based attributes	GradientBoosting	4.17e-13
Literature-based attributes	GradientBo	SHAP-based attributes	LightGBM	1.69e-14
Literature-based attributes	GradientBo	SHAP-based attributes	RandomForest	5.65e-13
Literature-based attributes	GradientBo	SHAP-based attributes	XGBoost	1.69e-14
Literature-based attributes	LightGBM	Statistical-based attributes	Adaboost	1.69e-14
Literature-based attributes	LightGBM	Statistical-based attributes	Catboost	5.57e-13
Literature-based attributes	LightGBM	Statistical-based attributes	GradientBoosting	1.69e-14
Literature-based attributes	LightGBM	Statistical-based attributes	LightGBM	1.69e-14
Literature-based attributes	LightGBM	Statistical-based attributes	RandomForest	1.12e-12
Literature-based attributes	LightGBM	Statistical-based attributes	XGBoost	1.69e-14
Literature-based attributes	LightGBM	SHAP-based attributes	Adaboost	1.69e-14
Literature-based attributes	LightGBM	SHAP-based attributes	Catboost	7.18e-13

Literature-based attributes	LightGBM	SHAP-based attributes	GradientBoosting	4.17e-13
Literature-based attributes	LightGBM	SHAP-based attributes	LightGBM	1.69e-14
Literature-based attributes	LightGBM	SHAP-based attributes	RandomForest	5.65e-13
Literature-based attributes	LightGBM	SHAP-based attributes	XGBoost	1.69e-14
Literature-based attributes	RandomFo	Statistical-based attributes	Adaboost	3.11e-11
<b>Literature-based attributes</b>	<b>RandomF</b>	<b>Statistical-based attributes</b>	<b>Catboost</b>	<b>7.81e-01</b>
Literature-based attributes	RandomFo	Statistical-based attributes	GradientBoosting	1.17e-07
Literature-based attributes	RandomFo	Statistical-based attributes	LightGBM	2.12e-06
<b>Literature-based attributes</b>	<b>RandomF</b>	<b>Statistical-based attributes</b>	<b>RandomForest</b>	<b>4.33e-01</b>
Literature-based attributes	RandomFo	Statistical-based attributes	XGBoost	8.81e-05
Literature-based attributes	RandomFo	SHAP-based attributes	Adaboost	1.26e-08
Literature-based attributes	RandomFo	SHAP-based attributes	Catboost	9.20e-03
Literature-based attributes	RandomFo	SHAP-based attributes	GradientBoosting	1.24e-11
Literature-based attributes	RandomFo	SHAP-based attributes	LightGBM	3.11e-11
Literature-based attributes	RandomFo	SHAP-based attributes	RandomForest	3.53e-02
Literature-based attributes	RandomFo	SHAP-based attributes	XGBoost	2.12e-06
Literature-based attributes	XGBoost	Statistical-based attributes	Adaboost	1.69e-14
Literature-based attributes	XGBoost	Statistical-based attributes	Catboost	1.70e-11
Literature-based attributes	XGBoost	Statistical-based attributes	GradientBoosting	1.69e-14
<b>Literature-based attributes</b>	<b>XGBoost</b>	<b>Statistical-based attributes</b>	<b>LightGBM</b>	<b>1.00e+00</b>
Literature-based attributes	XGBoost	Statistical-based attributes	RandomForest	1.99e-05
Literature-based attributes	XGBoost	Statistical-based attributes	XGBoost	1.69e-14
Literature-based attributes	XGBoost	SHAP-based attributes	Adaboost	1.69e-14
Literature-based attributes	XGBoost	SHAP-based attributes	Catboost	1.44e-07
Literature-based attributes	XGBoost	SHAP-based attributes	GradientBoosting	4.17e-13
Literature-based attributes	XGBoost	SHAP-based attributes	LightGBM	1.69e-14
Literature-based attributes	XGBoost	SHAP-based attributes	RandomForest	1.55e-05
<b>Literature-based attributes</b>	<b>XGBoost</b>	<b>SHAP-based attributes</b>	<b>XGBoost</b>	<b>1.00e+00</b>
Statistical-based attributes	Adaboost	Literature-based attributes	Adaboost	1.69e-14
Statistical-based attributes	Adaboost	Literature-based attributes	Catboost	7.46e-13
Statistical-based attributes	Adaboost	Literature-based attributes	GradientBoosting	1.69e-14
Statistical-based attributes	Adaboost	Literature-based attributes	LightGBM	1.69e-14
Statistical-based attributes	Adaboost	Literature-based attributes	RandomForest	3.11e-11
Statistical-based attributes	Adaboost	Literature-based attributes	XGBoost	1.69e-14
Statistical-based attributes	Adaboost	SHAP-based attributes	Adaboost	1.69e-14
Statistical-based attributes	Adaboost	SHAP-based attributes	Catboost	7.18e-13
Statistical-based attributes	Adaboost	SHAP-based attributes	GradientBoosting	4.17e-13
Statistical-based attributes	Adaboost	SHAP-based attributes	LightGBM	1.69e-14
Statistical-based attributes	Adaboost	SHAP-based attributes	RandomForest	5.65e-13
Statistical-based attributes	Adaboost	SHAP-based attributes	XGBoost	1.69e-14
Statistical-based attributes	Catboost	Literature-based attributes	Adaboost	5.57e-13
Statistical-based attributes	Catboost	Literature-based attributes	Catboost	6.84e-04
Statistical-based attributes	Catboost	Literature-based attributes	GradientBoosting	2.36e-05
Statistical-based attributes	Catboost	Literature-based attributes	LightGBM	5.57e-13
<b>Statistical-based attributes</b>	<b>Catboost</b>	<b>Literature-based attributes</b>	<b>RandomForest</b>	<b>7.81e-01</b>
Statistical-based attributes	Catboost	Literature-based attributes	XGBoost	1.70e-11

Statistical-based attributes	Catboost	SHAP-based attributes	Adaboost	5.57e-13
Statistical-based attributes	Catboost	SHAP-based attributes	Catboost	1.48e-06
Statistical-based attributes	Catboost	SHAP-based attributes	GradientBoosting	7.06e-12
Statistical-based attributes	Catboost	SHAP-based attributes	LightGBM	5.57e-13
Statistical-based attributes	Catboost	SHAP-based attributes	RandomForest	1.15e-06
Statistical-based attributes	Catboost	SHAP-based attributes	XGBoost	1.70e-11
Statistical-based attributes	GradientBo	Literature-based attributes	Adaboost	1.69e-14
Statistical-based attributes	GradientBo	Literature-based attributes	Catboost	3.75e-11
Statistical-based attributes	GradientBo	Literature-based attributes	GradientBoosting	1.69e-14
Statistical-based attributes	GradientBo	Literature-based attributes	LightGBM	1.69e-14
Statistical-based attributes	GradientBo	Literature-based attributes	RandomForest	1.17e-07
Statistical-based attributes	GradientBo	Literature-based attributes	XGBoost	1.69e-14
Statistical-based attributes	GradientBo	SHAP-based attributes	Adaboost	1.69e-14
Statistical-based attributes	GradientBo	SHAP-based attributes	Catboost	1.44e-07
Statistical-based attributes	GradientBo	SHAP-based attributes	GradientBoosting	4.17e-13
Statistical-based attributes	GradientBo	SHAP-based attributes	LightGBM	1.69e-14
Statistical-based attributes	GradientBo	SHAP-based attributes	RandomForest	1.55e-05
Statistical-based attributes	GradientBo	SHAP-based attributes	XGBoost	1.69e-14
Statistical-based attributes	LightGBM	Literature-based attributes	Adaboost	1.69e-14
Statistical-based attributes	LightGBM	Literature-based attributes	Catboost	9.75e-09
Statistical-based attributes	LightGBM	Literature-based attributes	GradientBoosting	1.69e-14
Statistical-based attributes	LightGBM	Literature-based attributes	LightGBM	1.69e-14
Statistical-based attributes	LightGBM	Literature-based attributes	RandomForest	2.12e-06
<b>Statistical-based attributes</b>	<b>LightGBM</b>	<b>Literature-based attributes</b>	<b>XGBoost</b>	<b>1.00e+00</b>
Statistical-based attributes	LightGBM	SHAP-based attributes	Adaboost	1.69e-14
Statistical-based attributes	LightGBM	SHAP-based attributes	Catboost	1.44e-07
Statistical-based attributes	LightGBM	SHAP-based attributes	GradientBoosting	4.17e-13
Statistical-based attributes	LightGBM	SHAP-based attributes	LightGBM	1.69e-14
Statistical-based attributes	LightGBM	SHAP-based attributes	RandomForest	1.55e-05
<b>Statistical-based attributes</b>	<b>LightGBM</b>	<b>SHAP-based attributes</b>	<b>XGBoost</b>	<b>1.00e+00</b>
Statistical-based attributes	RandomFo	Literature-based attributes	Adaboost	7.03e-10
<b>Statistical-based attributes</b>	<b>RandomF</b>	<b>Literature-based attributes</b>	<b>Catboost</b>	<b>4.82e-01</b>
<b>Statistical-based attributes</b>	<b>RandomF</b>	<b>Literature-based attributes</b>	<b>GradientBoosting</b>	<b>1.57e-01</b>
Statistical-based attributes	RandomFo	Literature-based attributes	LightGBM	1.12e-12
<b>Statistical-based attributes</b>	<b>RandomF</b>	<b>Literature-based attributes</b>	<b>RandomForest</b>	<b>4.33e-01</b>
Statistical-based attributes	RandomFo	Literature-based attributes	XGBoost	1.99e-05
Statistical-based attributes	RandomFo	SHAP-based attributes	Adaboost	1.83e-07
Statistical-based attributes	RandomFo	SHAP-based attributes	Catboost	1.92e-03
Statistical-based attributes	RandomFo	SHAP-based attributes	GradientBoosting	1.25e-11
Statistical-based attributes	RandomFo	SHAP-based attributes	LightGBM	7.03e-10
Statistical-based attributes	RandomFo	SHAP-based attributes	RandomForest	6.51e-03
Statistical-based attributes	RandomFo	SHAP-based attributes	XGBoost	1.99e-05
Statistical-based attributes	XGBoost	Literature-based attributes	Adaboost	1.69e-14
Statistical-based attributes	XGBoost	Literature-based attributes	Catboost	9.75e-09
Statistical-based attributes	XGBoost	Literature-based attributes	GradientBoosting	1.69e-14
Statistical-based attributes	XGBoost	Literature-based attributes	LightGBM	1.69e-14

Statistical-based attributes	XGBoost	Literature-based attributes	RandomForest	8.81e-05
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Statistical-based attributes	XGBoost	SHAP-based attributes	Adaboost	1.69e-14
Statistical-based attributes	XGBoost	SHAP-based attributes	Catboost	4.18e-02
Statistical-based attributes	XGBoost	SHAP-based attributes	GradientBoosting	4.17e-13
Statistical-based attributes	XGBoost	SHAP-based attributes	LightGBM	1.69e-14
Statistical-based attributes	XGBoost	SHAP-based attributes	RandomForest	1.55e-05
Statistical-based attributes	XGBoost	SHAP-based attributes	XGBoost	1.69e-14
SHAP-based attributes	Adaboost	Literature-based attributes	Adaboost	1.69e-14
SHAP-based attributes	Adaboost	Literature-based attributes	Catboost	7.46e-13
SHAP-based attributes	Adaboost	Literature-based attributes	GradientBoosting	1.69e-14
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SHAP-based attributes	Adaboost	Statistical-based attributes	Adaboost	1.69e-14
SHAP-based attributes	Adaboost	Statistical-based attributes	Catboost	5.57e-13
SHAP-based attributes	Adaboost	Statistical-based attributes	GradientBoosting	1.69e-14
SHAP-based attributes	Adaboost	Statistical-based attributes	LightGBM	1.69e-14
SHAP-based attributes	Adaboost	Statistical-based attributes	RandomForest	1.83e-07
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SHAP-based attributes	GradientBo	Statistical-based attributes	RandomForest	1.25e-11
SHAP-based attributes	GradientBo	Statistical-based attributes	XGBoost	4.17e-13
<b>SHAP-based attributes</b>	<b>LightGBM</b>	<b>Literature-based attributes</b>	<b>Adaboost</b>	<b>1.00e+00</b>
SHAP-based attributes	LightGBM	Literature-based attributes	Catboost	7.46e-13

SHAP-based attributes	LightGBM	Literature-based attributes	GradientBoosting	1.69e-14
SHAP-based attributes	LightGBM	Literature-based attributes	LightGBM	1.69e-14
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SHAP-based attributes	LightGBM	Statistical-based attributes	GradientBoosting	1.69e-14
SHAP-based attributes	LightGBM	Statistical-based attributes	LightGBM	1.69e-14
SHAP-based attributes	LightGBM	Statistical-based attributes	RandomForest	7.03e-10
SHAP-based attributes	LightGBM	Statistical-based attributes	XGBoost	1.69e-14
SHAP-based attributes	RandomFo	Literature-based attributes	Adaboost	5.65e-13
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SHAP-based attributes	RandomFo	Statistical-based attributes	XGBoost	1.55e-05
SHAP-based attributes	XGBoost	Literature-based attributes	Adaboost	1.69e-14
SHAP-based attributes	XGBoost	Literature-based attributes	Catboost	9.75e-09
SHAP-based attributes	XGBoost	Literature-based attributes	GradientBoosting	1.69e-14
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SHAP-based attributes	XGBoost	Literature-based attributes	RandomForest	2.12e-06
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SHAP-based attributes	XGBoost	Statistical-based attributes	Adaboost	1.69e-14
SHAP-based attributes	XGBoost	Statistical-based attributes	Catboost	1.70e-11
SHAP-based attributes	XGBoost	Statistical-based attributes	GradientBoosting	1.69e-14
<b>SHAP-based attributes</b>	<b>XGBoost</b>	<b>Statistical-based attributes</b>	<b>LightGBM</b>	<b>1.00e+00</b>
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SHAP-based attributes	XGBoost	Statistical-based attributes	XGBoost	1.69e-14

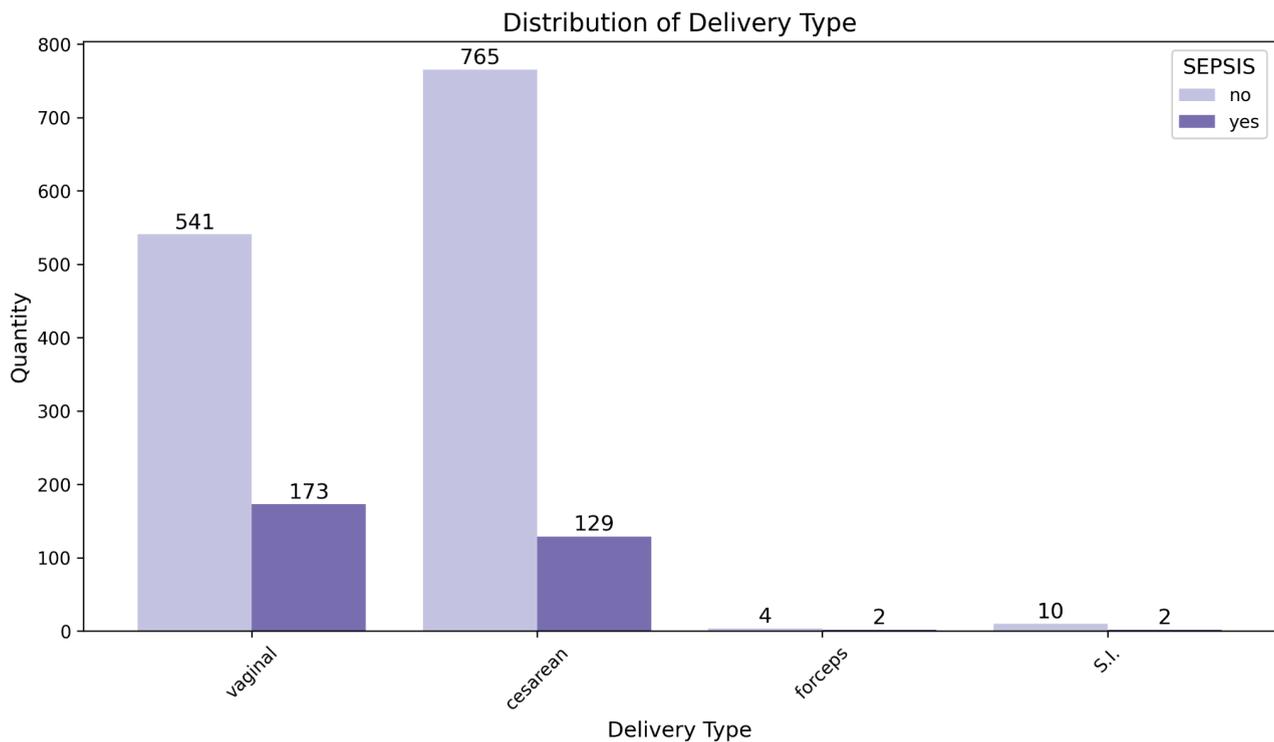


Figure 7. Distribution of delivery type associated with neonatal sepsis.

Figure 7 shows the distribution of the DELIVERY\_TYPE attribute, highlighting the relationship between delivery mode and the occurrence of neonatal sepsis. Among cesarean births, only 129 out of 894 neonates (14.4%) developed sepsis, while 173 (24.2%) did not. In contrast, among the 954 vaginal births, 541 cases (75.8%) did not progress to sepsis, whereas 765 (85.6%) did. For forceps-assisted deliveries (only 6 cases), 2 neonates (33.3%) developed sepsis and 4 (66.7%) did not. Finally, in the 12 cases with no information regarding delivery type (S.I.), only 2 (16.7%) evolved to sepsis, while 10 (83.3%) presented such an outcome.

From these data, a higher frequency of vaginal deliveries can be observed among neonatal sepsis cases. These findings are challenged by Yadav *et al.* (2023) [93] and Iqbal *et al.* (2024) [94], who reported a higher incidence of neonatal sepsis among cesarean deliveries in their studies. This type of delivery is often associated with longer hospital stays and delayed initiation of breastfeeding, two factors that impair the newborn's immune system and make them more susceptible to infections. The use of forceps, considered an instrumental delivery technique, was widely adopted before the implementation of the new Guidelines for Normal Birth Care by the Ministry of Health [95]. Currently, its use is restricted to specific situations, such as signs of fetal distress or prolonged labor. Vaginal delivery with minimal invasive interventions is therefore considered the safest and most recommended approach for most cases, which explains the low frequency of forceps deliveries observed in the present study [96].

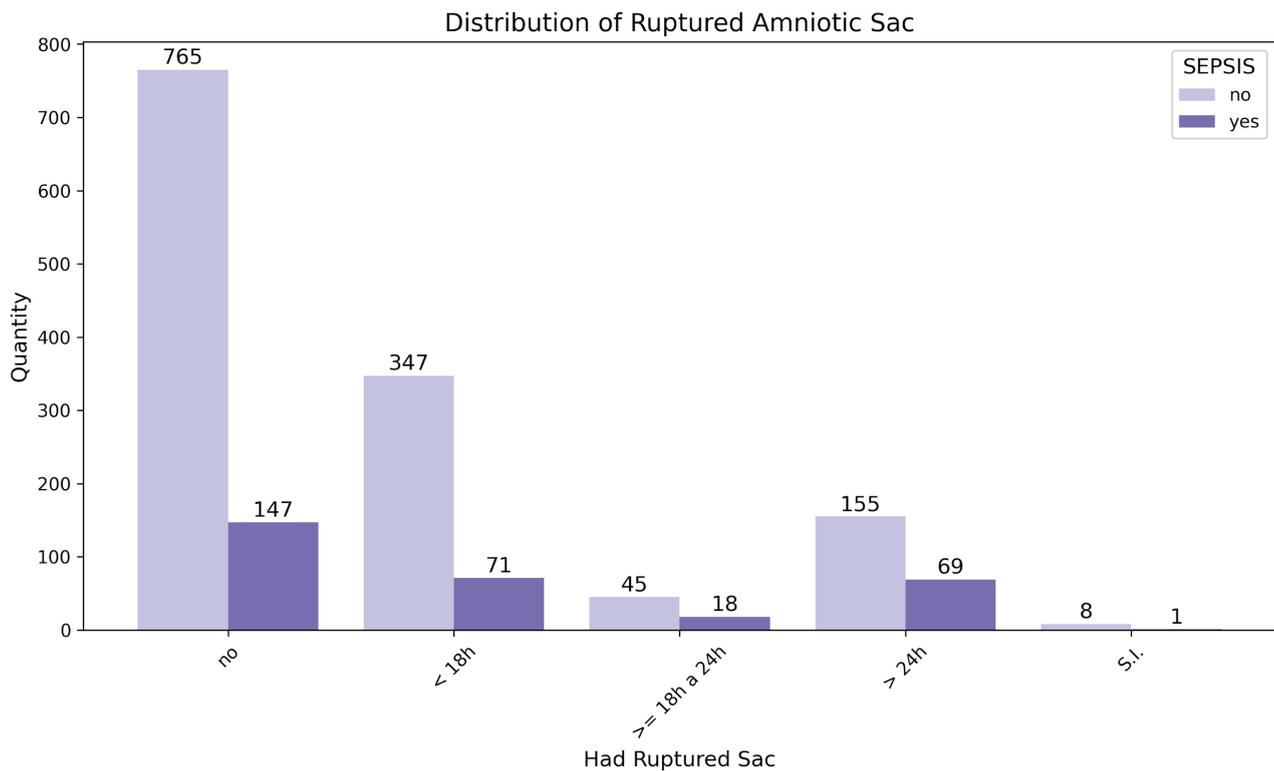


Figure 8. Distribution of ruptured amniotic sac associated with neonatal sepsis.

Figure 8 presents the distribution of the RUPTURE\_MEMBRANER attribute, which indicates the time elapsed from the rupture of the amniotic sac to the moment of the mother's hospital admission, stratified by the occurrence or absence of neonatal sepsis. Most admissions occurred without ruptured membranes (56%, n=912), of which 83% (n=765) did not develop sepsis and 16% (n=147) did. Among the 418 admissions with membrane rupture lasting less than 18 hours, 83% (n=347) did not develop sepsis and 17% (n=71) did. In the 63 cases where rupture occurred between 18 and 24 hours, 71% (n=45) did not present sepsis and 29% (n=18) did. In the 224 cases where rupture lasted longer than 24 hours, 69% (n=155) did not progress to sepsis and 31% (n=69) did. Finally, in a small number of records (0.5%, n=9), this information was unavailable, with 8 cases without sepsis and 1 with sepsis. These data indicate that the relative risk of sepsis increases as the duration of membrane rupture prior to hospital admission becomes longer.

Hincu *et al.* (2025) [97], in their prospective investigation of inflammatory markers within the first 72 hours of neonatal life, found that prolonged rupture of membranes influenced procalcitonin (PCT) levels. PCT is an important biomarker that rises in severe bacterial infections, such as sepsis. The same study identified an increased risk of early-onset neonatal sepsis associated with this biomarker, both within the first 12 hours of neonatal life and between 72 and 96 hours. C-reactive protein (CRP), another important biomarker, becomes elevated within the first 24 hours of infection and peaks between days 2 and 3, being considered a good indicator for monitoring disease progression and treatment effectiveness. Similar findings help explain the rationale for stratifying neonatal sepsis risk associated with PROM according to the intervals of <18 hours, 18–24 hours, and >24 hours, even though this specific form of stratification is not explicitly described in the literature. The Brazilian Society of Pediatrics (2022) [98], for example, in its most recent scientific document on early-onset neonatal sepsis, considers membrane rupture lasting 18 hours or longer

as an important risk factor. PROM lasting more than 18 hours also appears in the same document as one of the indicators for initiating antibiotic therapy to prevent early-onset sepsis caused by Group B Streptococcus (GBS), one of the main and most severe etiological agents associated with neonatal sepsis risk.

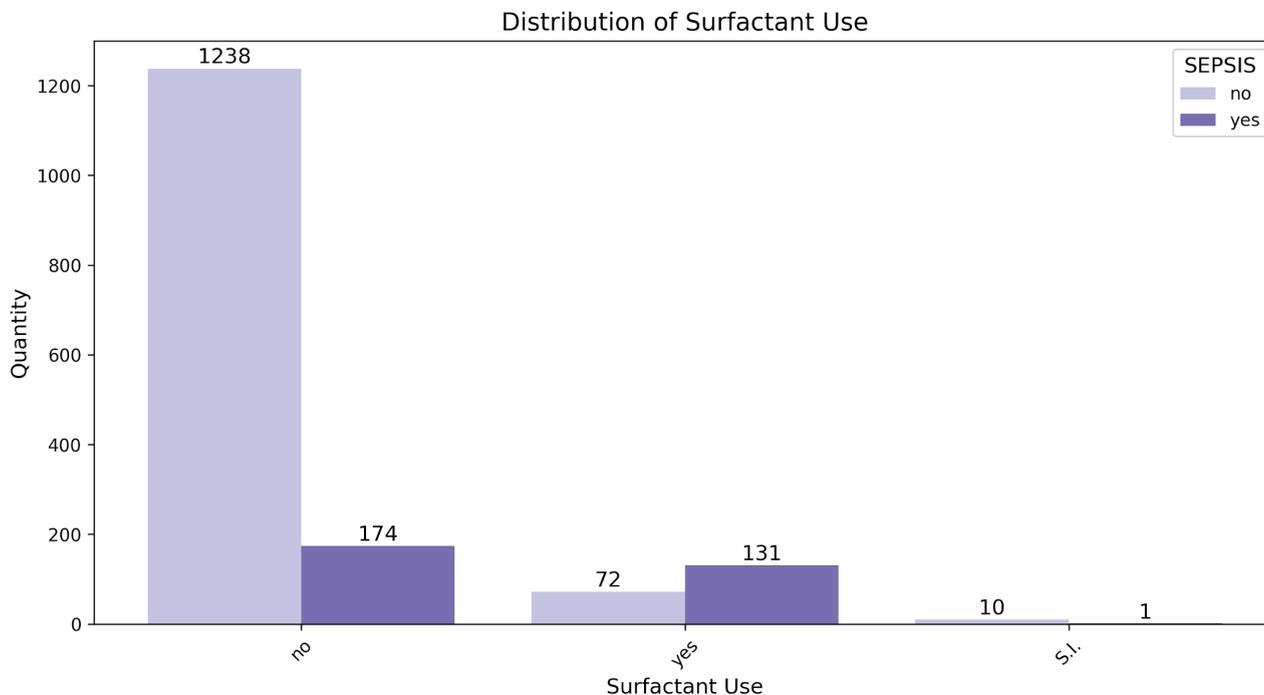


Figure 9. Distribution of surfactant use associated with neonatal sepsis.

Figure 9 presents the distribution of the SURFACTANT attribute, which indicates whether the neonate received surfactant therapy. Among those who did not receive surfactant, 87% (n=1,238) did not develop sepsis, while approximately 12% (n=174) did. Among those who received surfactant, 35% (n=72) did not develop the disease, whereas 64% (n=131) did. Finally, in the 11 cases with no information available (S.I.), 90% (n=10) did not develop sepsis, and only 9% (n=1) did. These findings suggest a strong association between surfactant use and the occurrence of sepsis, with sepsis being more common among newborns who received surfactant therapy. The use of surfactant is often necessary in more severe and complex clinical cases and is also more common in premature infants.

In a study conducted by Cucerea *et al.* (2023) [99], the administration of surfactant was found to have a significant association with neonatal morbidities, including sepsis, mortality, and length of stay in the neonatal intensive care unit (NICU). This finding aligns with our results, where 64% of patients with sepsis received surfactant therapy. These observations suggest that surfactant administration may serve as an indicator of disease severity in neonates, as it is often required in critically ill patients who are at higher risk for adverse outcomes.

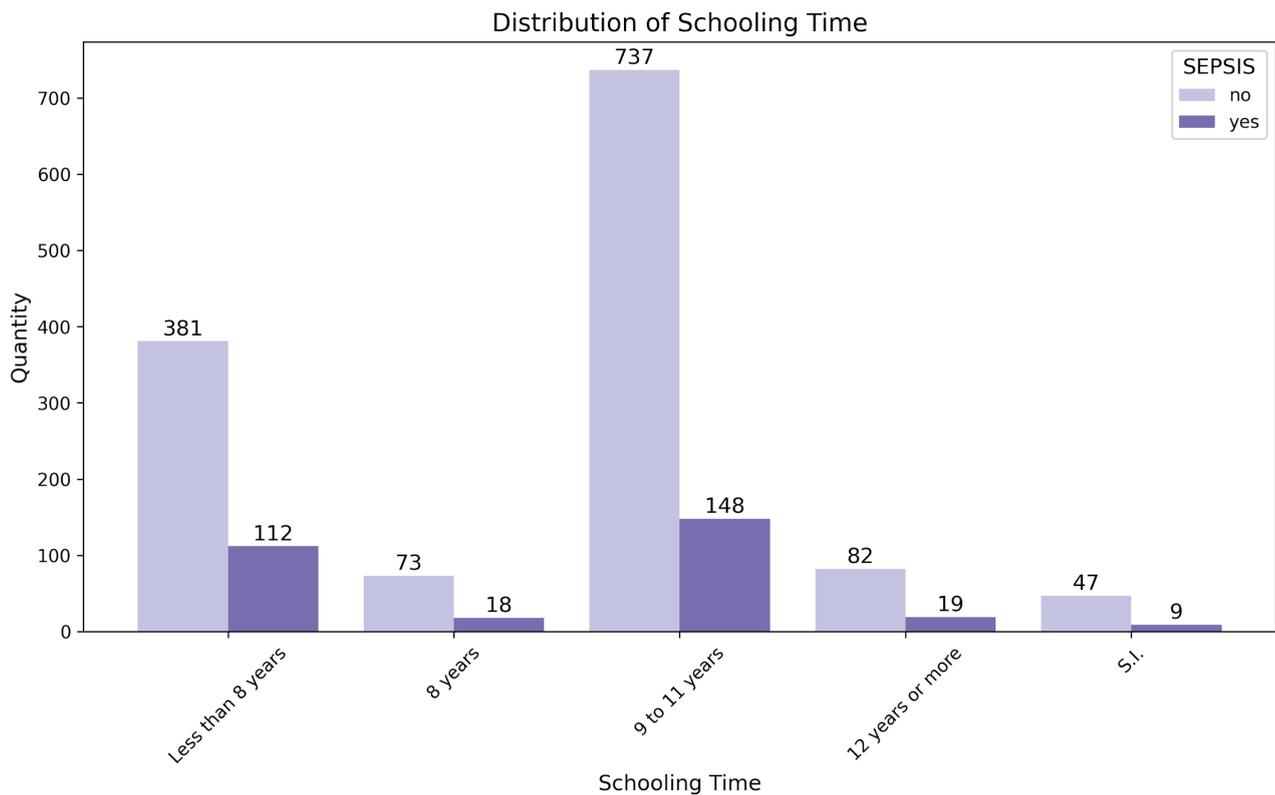


Figure 10. Distribution of schooling time associated with neonatal sepsis.

Figure 10 presents the distribution of the EDUCATION\_YEARS attribute, which indicates the length of formal education of the mothers. Among mothers with less than 8 years of schooling, neonatal sepsis occurred in 22% of cases (n=112), while 77% (n=381) did not develop the disease. For neonates born to mothers with exactly 8 years of schooling, the incidence of neonatal sepsis was 19% (n=18), while 80% (n=73) did not present the disease. The largest portion of the sample consists of mothers with 9 to 11 years of education (n=885); within this group, approximately 83% (n=737) did not develop sepsis, while 16% (n=148) did. A significant decrease in sample size is observed for mothers with 12 or more years of education (n=101), among whom 81% (n=82) did not develop sepsis, while 18% (n=19) did. There were 56 records with missing information (S.I.), among which nearly 84% (n=47) did not develop sepsis, and only 16% (n=9) did.

A slight trend toward a higher incidence of neonatal sepsis is observed among mothers with lower education levels (<8 years). It is also possible to note a decline in sepsis incidence as maternal education increases. However, this trend is not linear and may be difficult to interpret due to the relatively small number of cases. These findings are also relevant for defining the current profile of pregnant women and for exploring the correlation between socioeconomic factors and maternal-infant health. Regarding maternal education, our study did not identify a significant association between the mother's years of schooling and neonatal sepsis. This is consistent with findings from Salama & Tharwat (2023) [100], Milton *et al.* (2022) [101] and Monde *et al.* (2024) [102] who also found no statistically significant relationship between maternal education levels and neonatal sepsis incidence.

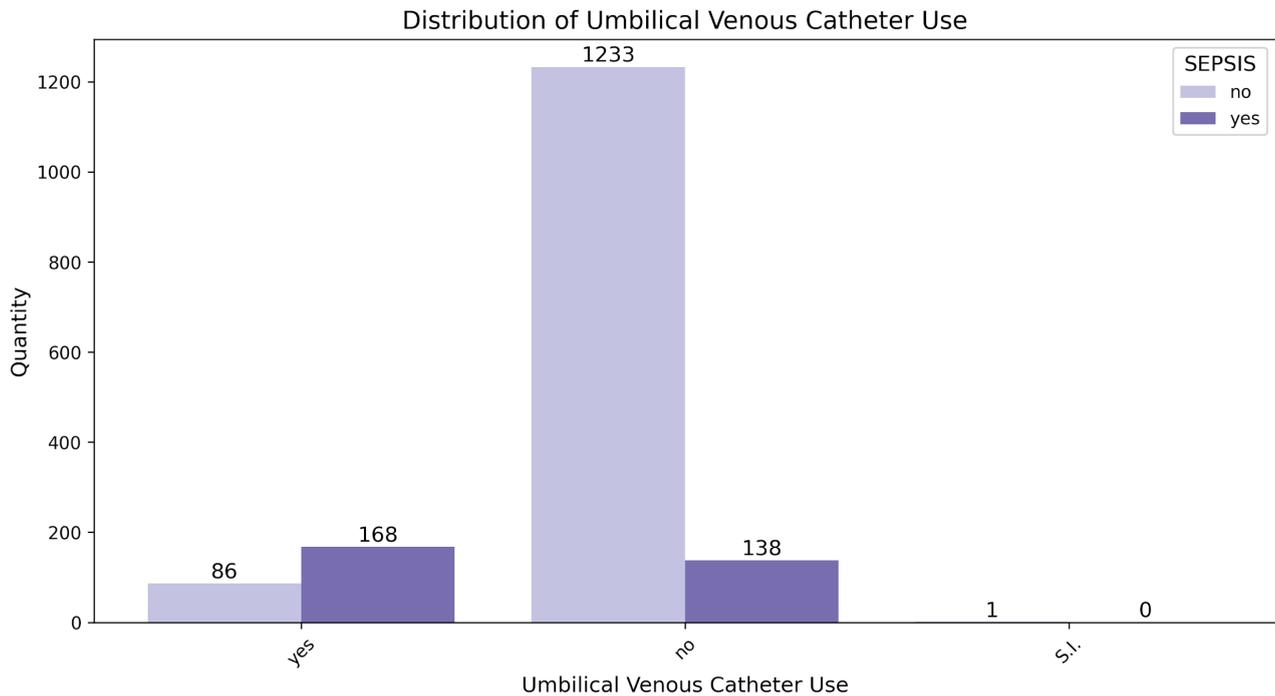


Figure 11. Distribution of umbilical venous catheter use associated with neonatal sepsis.

Figure 11 presents the distribution of the UMBILICAL\_VENOUS\_CATHETER attribute, which indicates whether neonates underwent umbilical venous catheterization. Among neonates who underwent this procedure, 66% (n=168) developed sepsis, while 33% (n=86) did not. Among those who did not undergo catheterization, 89.9% (n=1,233) did not develop sepsis, and only 10% (n=138) did. There is a considerably higher proportion of sepsis cases among neonates who required the device, consistent with the fact that umbilical catheterization is considered an invasive procedure and, therefore, a potential entry point for pathogenic agents. It can also be inferred that neonates undergoing umbilical catheterization are clinically vulnerable to infections due to the severity of their condition, with the use of the device representing a risk factor for the development of neonatal sepsis.

Regarding umbilical venous catheterization (UVC), a procedure commonly performed in critically ill neonates, studies have shown that its use is associated with various complications, including infection [103, 104]. However, a study by Corso *et al.* (2023) [105], did not find statistically significant evidence of an association between UVC use and sepsis. Similarly, in our study, we observed comparable numbers of sepsis cases in both groups (neonates who received UVC and those who did not), suggesting no clear relationship between UVC use and the development of sepsis. Although it is well recognized that UVC use can increase the risk of infection, with appropriate management and care practices, this does not necessarily translate into neonatal sepsis.

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